TOWN OF

LITCHFIELD, NH

LAND USE LAWS

2009 APPENDIX A

AMENDED; May 2003; July 20, 2004; July 18, 2006

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1.0 ROADWAY CONSTRUCTION PLANS

1.1 General Plans

Each construction plan sheet shall contain the name of the project, the Tax Map and lot number, the date plans were prepared, the scales used (including a bar scale), and the name and address of the engineer. Each plan sheet shall be numbered consecutively. The plan set shall include a front sheet with the project identification, a location map and index of sheets, roadway plans/profiles, typical roadway section, miscellaneous construction details and cross sections. The front sheet shall be stamped and signed by the Professional Engineer responsible for the design of the project.

All areas to be disturbed for construction of streets, drainage ways, and structures; sewer, water and electric lines, erosion and sediment control structures, and other areas to be disturbed for the construction of improvements shall show existing topography in dashed lines and proposed contours shown in solid lines at a contour interval no greater than two (2) feet plus spot elevations. Soil types and boundaries shall be labeled and shown in dotted lines. Existing topographic features, natural and man-made shall be shown. The proposed construction shall be shown including roadway center line (with curve data), edges of pavement, right-of-way, slope lines designated as cut or fill lines, drainage facilities (including drainage easements), underground utilities, temporary and permanent erosion control features and other construction details as required. Each adjacent proposed lot shall be shown with lot lines and lot numbers taken from the final subdivision plat. Plans shall be drawn at a scale of one (1) inch equals fifty (50) feet, or larger scale as approved by the Planning Board or the Board's Agent.

1.2 Profiles

Profiles of all proposed streets, showing existing and proposed elevations along center lines of all proposed streets, proposed grades, location of vertical curves, "K" values, drainage structures, piping, erosion control features and other pertinent details. Profiles of the proposed drainage pipe systems shall be shown on the profiles and include proposed pipe invert elevations, size of pipe, and pipe slope. Profiles shall be drawn at the same horizontal scale as the plans and one (1) inch equals five (5) feet or ten (10) vertical scale or greater.

1.3 Cross Sections

Cross sections of all proposed streets at fifty (50) foot intervals and at all catch basins or cross culverts shall be included in the plans. These shall include the existing ground, proposed roadway, proposed roadway "box" (base materials), drainage features, underground utilities and roadway cross slope (if it is superelevated). Existing grades and proposed final grades shall be noted. The proposed side slopes of each cut or fill shall be noted on the cross section (i.e., 4:1, 2:1, etc.) as well as the proposed pavement cross slope rate, expressed in terms of a percent slope (i.e., 2%, 4%, etc.). Cross-sections shall be drawn to a convenient scale of not smaller than one (1) inch equals ten (10) feet; both the horizontal and vertical scales shall be the same.

1.4 Construction Details

Construction details of all streets, driveways, curbing, guardrail (including terminal treatment), sidewalks, drainage structures, temporary and permanent sediment and erosion control structures and any other required improvements shall be shown at a convenient scale. Reference to NHDOT Standard Plan details is acceptable and preferred for appropriate items. It is the intent to provide construction drawings in sufficient detail to communicate the intent of the designer and eliminate confusion in the field.

1.5 Erosion and Sediment Control Plans (Amended May 2003)

Plans and other information indicating how increased runoff, sedimentation, and erosion shall be controlled during and after construction of required improvements. Stormwater and Erosion Control measures shall comply with Appendix D, (*Stormwater Management and Erosion Control).* The applicant shall submit a stormwater management and erosion control plan to the Planning Board for any tract of land being developed or subdivided, where one or more of the following conditions are proposed:

a. A cumulative disturbed area exceeding 15,000 square feet.

b. Construction or reconstruction of a street or road.

c. A subdivision of more than three building lots.

d. Disturbed critical areas. (See Definition in Appendix D)

2.0 GENERAL REQUIREMENTS

2.1 Monuments

Monumentation shall be provided for the roadway right-of-way and property lines. The proposed right-of-way shall be bounded at each point of curvature (PC); point of tangency (PT) and along tangent sections with at least one bound every 600 feet. The monuments shall be set no less than 6" and no higher than 9" above the final grades. Monuments shall be granite or reinforced concrete and shall conform to Section 622 of the NH Department of Transportation, Standard Specifications for Road and Bridge Construction except for size. The required sizes of monuments are as follows:

a. Roadway Right of Way. 6" X 6" X 4'-0" in length.

b. Property lines. 4" X 4" X 4'-0" in length. A bound shall be placed on all property lines at break points.

c. Easements. Solid iron pins 1/2" minimum diameter X 5' in length placed at each break point in the easement line. Pins shall protrude 4" above the natural ground surface if in mowing land, 6" if in land not under cultivation and 12" if in woodland. Each iron pin shall also be identified with a 4" wooden riser, painted orange and tied with orange surveyor's flagging. Conservation easements shall be capped with the yellow plastic caps.

Where the placement of a required bond is impractical or impossible, the monumentation shall be provided by an approved alternate method.

At least one right-of-way bound per roadway shall be designated as a project benchmark. The elevation of each designated bound shall be determined and recorded on the as-built plans submitted to the Town. The reference elevation shall be the United States Geodetic Survey (USGS) system, if a USGS reference marker is located within 1,000 feet of the subdivision. Prior to the issuance of an occupancy permit, all monumentation must be verified by the Code Enforcement Officer or Town's Agent and/or certified by NH Licensed Land Surveyor.

Each stone bound shall be provided with a metal rod sufficient in size and volume to elicit a response from a portable metal detection device. It is preferable that the iron rod be embedded in the stone bound.

3.0 ROAD DESIGN STANDARDS

3.1 Street System

a. Reserve strips controlling access to roads shall be prohibited except where their control is definitely placed in the Town under conditions approved by the Planning Board.

b. Street jogs with centerline offsets of less than 125 feet shall not be permitted.

c. Roads shall be designed to intersect as nearly as possible at right angles and no street shall intersect any other street at less than 60 degrees. The centerlines of no more than two accepted rights-of-way shall intersect at any one point.

d. Cul-de-sac roads shall be provided with a paved Town approved turn-around conforming to Exhibits F, G or H (by approval of Planning Board only). Such turn-around to be removed at the time of extension or connection of such dead-end roads.

e. Road grades shall conform to those specified in the Table of Geometric Standards of these regulations.

3.2 TABLE OF GEOMETRIC STANDARDS

Item Description	*Type of Roadway*	
	Arterial	***Non-Arterial***
Travel Way Width, each lane	13’	12’
Shoulder Width, unpaved	DNA	4’
Hot Bituminous Pavement widths		
1” Wearing Course (Type E)	26’	24’
2” Binder Course (Type B) - no curbing		24’ 6”
- with curbing		26’ 6”
3” Binder Course (Type B)	28’ 6”	
Base Course Material Thickness		
Crushed Gravel	12”	6”
Gravel	12”	12”
Sand in Ledge Areas	24”	24”
Face of Guardrail Offset From Centerline	16’	15’
Minimum Cross Slope	3%	3%
Maximum Cross Slope (Superelevation)	8%	4%
Right-Of-Way Width	75’	50’
Design Speed	45 mph	
Collector Road		35 mph
Local Road		30 mph
Maximum Vertical Grade (Profile)	6%	8%
Minimum Vertical Grade (Profile)	.75%	.75%
Minimum Angle of Intersection (Degrees)	60	60
Sidewalk - Width (Minimum)	8’	
- Hot Bituminous Pavement Thickness	2”	
- Concrete Pavement (Un-reinforced)	4”	
- Crushed Gravel Base	6”	
Curb, EOP, & ROW Radii at Intersections	40’	35’

NOTES:

a. The reference manual to be used in determining the requirements for stopping sight distances (vertical and horizontal), intersection sight distance, minimum centerline radius, superelevation runoffs and other miscellaneous design criteria is the 1990 edition (or latest edition) of the American Association of State Highway and Transportation Officials' (AASHTO) "A Policy on Geometric Design of Highways and Streets".

b. The Planning Board shall determine the functional classification of a proposed roadway and associated design speed.

c. In no way are these Guidelines/Regulations to be considered a substitute for sound engineering judgment.

d. See Exhibits A, B, C, D and E for typical roadway sections and construction details.

4.0 STORMWATER MANAGEMENT

Stormwater and Erosion Control measures shall comply with Appendix D, (*Stormwater Management and Erosion Control).* The entity or individual responsible for construction site operations shall control runoff, erosion and sediment during and after construction through any measure approved by the Planning Board or Town Engineer. In each instance, the measure or measures shall be suitable to the site and subject to approval by the Planning Board and/or the Town Engineer. All runoff, erosion and sediment control measures and the design of all drainage structures and systems shall meet the design standards and specifications set forth in these regulations, the current version of Stormwater Management and Erosion and Sediment Control Handbook for Urban and Developing Areas of New Hampshire prepared by the USDA - Soil Conservation Service (now Natural Resource Conservation Service), NHDES and Rockingham County SCS, 1992, as amended and the current Manual on Drainage Design for Highways, published by the New Hampshire Department of Transportation. *(Amended May 2003)*

4.01 Definitions – (See additional definitions in Appendix D)

Erosion: The wearing away of the land surface by the action of wind, water or gravity.

Sediment: Solid material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water or gravity as a product of erosion.

Runoff: The portion of precipitation that makes its way overland toward stream channels or lakes.

Measure: A specific procedure designed to control runoff, erosion or sediment.

4.1 Hydrology: Runoff Calculation Methods

The calculation of runoff is of prime importance to the overall scheme of drainage design. The Town of Litchfield approves four methods to compute runoff.

a. The Rational Method - This method is usually used when the drainage area is less than 200 acres. It is also used extensively for on-site design.

b. The NEHL-AWM Method - This method is usually used when the drainage area is greater than one square mile.

c. The Potter Method - This method is usually used when the drainage area is between 200 and 1000 acres. This method provides a check on either of the preceding methods.

d. The Soil Conservation Service (SCS) Method - This method can be used when the drainage area is greater than 10 acres. The design storm shall be a 10 year or 25 year, 24-hour rainfall of a storm distribution Type III.

The methodology used in computing the runoff for the Rational Method, NEHL-AWM Method and Potter Method is found in the NHDOT Drainage Manual as well as many popular Engineering Texts.

The following three SCS publications, which provide the details on hydrologic analyses using the SCS methods, are widely distributed and used:

* NEH-4: Hydrology, Section 4, National Engineering Handbook.
* TR-20: Computer Program for Project Formulation, Hydrology, Technical Release No. 20.
* TR-55: Urban Hydrology for Small Watersheds, Technical Release No. 55.

4.2 Drainage Design Criteria

The following design criteria shall apply to proposed drainage systems:

a. Cross Culvert Pipes: 25-year storm frequency; check impacts for 50-year storm.
b. Closed Drain System: 10-year storm frequency; check impacts at sag points for a 25-year storm.
c. Storm Water Detention Facilities: 25-year storm frequency; check impacts for 50-year storm.
d. Storm Water Retention Facilities: 25-year storm frequency; check impacts for 50-year storm.
e. Box Culverts and Bridges: 50-year storm frequency; check impacts for 100-year storm.

The Planning Board reserves the right to require that storm drain systems be designed for less frequent, more intense rainfalls where conditions warrant.

4.3 Drainage Pipe Design

a. Documentation of Computations for Culvert Pipes: All computations for culvert pipes shall be documented and included in the drainage report. These shall be performed under the supervision of a NH Licensed Professional Engineer. The Professional Engineer shall stamp and sign the drainage report.

b. Use of Rainfall and Floods Records: All available records concerning rainfall and floods shall be used in the design of culverts and storm sewers.

c. Pipe Culvert Design: Pipe culverts will be designed as open flow channels. They will either be under inlet or outlet control. The exact control can be found by following the procedure outlined in "Hydraulic Charts for the Selection of Highway Culverts", published by the Bureau of Public roads as H.E.C. No. 5. This material can also be found in the NHDOT Drainage Manual.

d. Pipe Culvert Size: Minimum pipe culvert sizes are as follows:
   * Roadways - 15"
   * Drives - 12"

e. Pipe Culvert Bridge: Pipe culverts with a span of 10 feet or more will be considered a bridge.

f. Natural Channel Culverts: It is preferred that culverts be located to fit natural channels in lines and grade.

g. Culvert Flow Minimums: The minimum grade of culverts shall be 0.4% or able to maintain a velocity of 2 fps while flowing one-third full.

h. Culvert Collars: Collars will be designed for culverts whose grades exceed 20%.

i. Outlet Protection: When the computed outlet velocity is in the range beyond normal design of 10 fps, additional outlet protection shall be considered.

j. Culvert Flow Controls: The maximum headwater depth of flow immediately upstream from a pipe culvert shall be controlled by the following:

* Damage to adjacent property;
* Damage to culvert and the roadway;
* Traffic interruption;
* Hazard to human life; and,
* Damage to stream & floodplain environment.

As a guide, the following table may be used under "normal conditions":

Pipe Size	Maximum Allowable Headwater
12" - 30"	2 times pipe diameter
36" - 48"	1-1/2 times pipe diameter
54" - up	1 times pipe diameter

k. Culvert Depth: Minimum cover for culverts, measured between the pipe crown and finished grade, shall be as follows:

* Paved Roads - 3'
* Unpaved Roads - 3'
* Under Drives - 1'
* Under Grass - 2'

l. Pipe Material: Acceptable pipe materials for roadway culverts is reinforced concrete pipe. Drive pipes are the developer's option. Underdrain pipes may be metal CMP or plastic pipe.

m. End Sections, Headers, or Stone Slope Paving: All culverts shall be constructed with end sections, headers, or stone slope paving as specified below. End sections shall be permitted on all pipes less than 48" diameter, except 24" diameter where there is an active stream.

n. Catch basins and Drop Inlets. Catch basins and drop inlets shall be reinforced concrete unless specifically authorized by the Planning Board.

4.4 Ditches

a. Ditch Length Requirements: A maximum length of 400 feet for a ditch to a catch basin or drop inlet is required. Local conditions may require variations. Any variations must be approved by the Planning Board or the Board's Agent.

b. Ditch Minimum Grade: In order to keep the ditch self-cleaning, a minimum grade of 0.5% shall be required, except for "Site Specific Swales" as required by RSA 485-A:17.

c. Erosion Control: All ditches shall be checked for possible erosion and subsequent siltation of streams. Acceptable methods of treatment include matting for erosion control, stone for erosion control, stone fill and riprap.

d. Ditch Grade Control: All ditches steeper than 5% shall be adequately protected against soil erosion. Matting for erosion control or stone linings shall be provided, as determined by an engineering evaluation.

e. Off-site Runoff Controls: Ditches shall be used at the top of backslopes only when excessive off site runoff damage slopes and/or overtax on-site systems.

4.5 Subsurface Drainage (Underdrain)

Subsurface drainage systems (underdrain pipe) shall be provided where the seasonal high ground water table is within five feet (5') of the finished roadway grade. Test pits or borings in roadway cut sections shall be taken, as required or ordered by the Planning Board's Agent, to locate the Seasonal High Water Table (SHWT) and determine the need for underdrain pipe. This pipe shall be perforated PVC or metal with a minimum diameter of 6". Alternate underdrain pipe material shall require specific approval by the Planning Board of its Agent. This design shall be supervised by a NH Licensed Professional Engineer.

5.0 PERFORMANCE GUARANTY /BONDING REQUIREMENTS AND PROCEDURES (Amended July 20, 2004)

The following apply to roads, site plans and subdivisions within the Town of Litchfield.

All required bonding shall be in place prior to the start of any construction. The owner or their agent (Principal) shall file with the Code Enforcement Officer a certificate from the Town's (Obligees) Administrative Assistant indicating that a performance guaranty has been posted for the project. In addition:

a. Guaranty/Bonding shall be sufficient to ensure the satisfactory completion of all necessary improvements noted on the approved subdivision and/or site plan. The amount of the guaranty will be based on an estimate provided by the Board's designated representative (E.g. consulting engineer). The cost of the estimate shall be paid by the applicant. (A sample application may be provided upon request)

b. The guaranty shall be approved as for form and surety by the Town counsel.

c. The initial bond shall include an amount to cover escalation costs for two years, which may not exceed 10% per year. (RSA 674:36, III (b)).

d. The bond shall be reviewed and adjusted at intervals not to exceed two years.

5.1 Types of Bonds.

(Amended July 18, 2006)

Two types of bonds are used for subdivision site plan and improvements.

a. **Performance Bond**- for subdivision and site plan improvements, include but are not limited to construction of roads, common driveways in Housing for Older Person (HOP) developments, water supply and wastewater connections (excluding subsurface disposal systems), stormwater controls and temporary erosion control measures. Additionally, for vegetative measures (installation and replacement), including but not limited to approved landscape plans, man-made and vegetative buffers and required seeding/plantings. Under special circumstances, critical buffers shall require legal document(s) that ensure maintaining the approved plantings until there is mutual agreement by all interested parties to modify or cease such an agreement.

b. **Maintenance Bond -** including but not limited to roads, stormwater structures and temporary erosion control measures for a period of two (2) years.

5.2 FORMS of bonding allowed

- Contact the Litchfield Town Hall for Bond Forms allowed by the Town of Litchfield (Obligee).

a. Cash.

b. **Cashiers Check** (Guaranteed funds available)

c. **Passbook** (NH Bank)

d. **Surety Bond** (shall expire not less than 1 year after issuance)

e. **Irrevocable Letter of Credit**

5.3 PROCEDURE

(Amended July 18, 2006)

a. A bond amount shall be recommended by Litchfield's (Obligees) designated representative (E.g. Consulting engineer) upon Planning Board and applicant (Principal) agreement on the final plan layout. Bond amounts and initial term (I.e. expiration date) shall be set prior to Planning Board Approval and be reviewed at the pre-construction meeting for adequacy by the Boards designated representative. **Final bond amounts shall be authorized by the Board of Selectmen.**

b. Bond/s shall be filed prior to any construction

c. Bond reduction shall be requested in writing

d. Bond reduction shall be in accordance with the format as described

e. Bond reduction shall be recommended by Litchfield's (Obligees) designated representative (E.g. consulting engineer) and approved by a vote of the Planning Board. **Any bond reduction requires written authorization from the Board of Selectmen.**

f. Bond release shall be requested in writing

g. Bond release shall be recommended by Litchfield's (Obligees) designated representative (E.g. consulting engineer) and approved by a vote of the Planning Board. **Any bond release requires written authorization from the Board of Selectmen.**

h. The phasing of construction work on major subdivision and/or site plan may be permitted on a case-by-case basis at the discretion of the Planning Board. The phasing of the performance bond, cash bond may also be permitted with the specific approval of the Planning Board. **Any phasing of a bond amount requires written authorization from the Board of Selectmen. Any phasing must be approved by the Planning Board prior to subdivision and/or site plan approval.**

i. Under no circumstances shall a building permit be issued for a building on a portion of roadway that has not been properly bonded.

j. Where applicable, a Maintenance bond is required

5.4 RELEASE REQUIREMENTS

(Amended July 18, 2006)

a. **PARTIAL RELEASE -** may be approved under the following conditions, after all necessary inspections and as recommended by the Planning Boards designated representative (E.g. Consulting engineer and/or staff): **Any partial release of the bond amount requires written authorization from the Board of Selectmen**.

1. Subdivisions
   a.) A substantial portion of the project has been completed (Greater than 25% of the bond value).

2. Site Plan Improvements
   a.) Residential – Housing for Older Persons (HOP): A substantial portion of the project has been completed (Greater than 25% of the bond value).
   b.) Non-Residential:- As recommended by the Planning Boards designated representative (E.g. Consulting engineer)

c.) Site is stable

d.) Maintenance bond is required

3. Landscape- no partial release
   a) Landscaping shall be guaranteed for a period of two (2) years from time of planting

4. Erosion Control- no partial release

b. **RELEASE REQUIREMENTS -**Before voting to release any of the performance guaranty/bond, the Planning Board shall receive acceptable written statements as follows: (Any release of the bond amount requires written authorization from the Board of Selectmen.)

1. Where applicable, the officers of the appropriate public utilities have accepted the location, specifications and construction of utilities and are in accordance with the final plan diagram and all applicable standards and requirements. (E.g. Waste water collection systems, water mains and hydrants have been properly installed, tested and in operating condition)

2. An adequate Maintenance Bond has been furnished to the Town.

3. Request for release in writing

4. Inspection by designated representative (E.g. Consulting engineer and/or staff) with recommendation to the Planning Board.

5. Planning Board vote to approve release

6. Board of Selectmen authorize any bond release

7. Release shall not be less than the amount required for the Maintenance bond.

c. **MAINTENANCE BOND -**

1. At the end of two (2) years, the maintenance bond may be released upon inspection by the Planning Boards designated representative (E.g. Consulting engineer and/or staff) and where all requirements have been met in accordance with the Town of Litchfield's zoning, subdivision or site plan regulations.

2. Before voting to release the maintenance bond, the Planning Board shall receive documentation (written proof) of the following: (Any release of the bond amount requires written authorization from the Board of Selectmen).

   a) All permanent bounds and monuments on street lines and on lot lines have been installed by a registered land surveyor and the As-Built plan depicts these accurately.

   b) The appropriate public utilities necessary for basic services and fire protection have certified in writing that they have accepted the installed fixtures and/or equipment and that these have been installed in proper operating condition, are accurately depicted on the As-Built plans and meet all applicable standards and requirements.

c) Stormwater structures, roads and drainage features are clean and free of sediment, debris and temporary erosion controls have been removed or adequate funds secured for their removal at a later date.

d) As-built plans have been prepared, submitted and accepted as final by the Planning Board upon the recommendation of their designated representative (E.g. Consulting engineer and/or staff).

e) A deed for the public right-of-way has been approved by Town Counsel, submitted to and approved by the Planning Board.

5.5 OTHER REQUIREMENTS

a. All bonds shall be in force until released by the Town (obligee) upon completion of bonded improvements, or as otherwise required by law.

b. Provider (Surety) and or owner/developer (Principal) shall provide the following for all bonds:

1. Sixty (60) days prior to the expiration of the bond, the provider (Surety) and or owner/developer (Principal) shall notify the Town of Litchfield (Obligee).

2. The provider (Surety) and/or owner/developer (Principal) shall forward proof of bond renewal at least 30 days prior to the expiration date.

5.6 ROAD MAINTENANCE BOND

The purpose of the post construction performance guaranty/maintenance bond is to provide funds to repair or reconstruct subdivision roads, which have become damaged due to latent defects or other unexpected events. The Town Road Agent and Consulting Engineer shall determine if a repair or reconstruction procedure will be required. The Maintenance Bond shall be in accordance with the procedures below.

a. The Developer (Principal) shall submit to the Town (Obligee) a Post Construction Performance/Maintenance Bond to be in effect for a period of two (2) years. The beginning date of the two-year period shall be the date of the Planning Board vote to accept the Post Construction Performance/Maintenance. Any maintenance bond amount requires written authorization from the Board of Selectmen. Bond value amount and specifically begin the period. The calculated Bond dollar value shall not change for the entire two-year period.

b. The Post Construction Performance/Maintenance Bond shall be Fifteen Dollars ($15.00) per linear foot of roadway, adjusted as provided herein. For all other maintenance bonds, where applicable, amounts shall be calculated by the Planning Boards designated representative (Consulting engineer) upon final design or specifications being agreed upon by the applicant and the Planning Board. Final bond amount requires written authorization from the Board of Selectmen

c. This basis for calculating bond amount shall be adjusted based on the Engineering News Record (ENR) construction cost index in effect as of the date the bond is calculated. The basis for the ENR adjustment factor is 5,300. The ENR index at the time of the bond calculation shall be divided by 5,300 and the resulting number applied to the $15.00 per linear foot bond rate to determine the adjusted bond amount. This number shall be reviewed by the Board and the consulting engineer on a biennial basis.

d. Calculation. The Post Construction Performance Bond will be calculated by multiplying the linear footage of the roadway to be bonded times $15.00 times the ENR adjustment factor. Example: The bond required for 1,000 feet of roadway at the time when the ENR is 5,500 is calculated as

1,000 feet X $15.00 X 5,500/5,300 = $ 15,566

e. The Planning Board shall vote to approve the release of the Maintenance Bond after review of a written report/recommendation from the Town Road Agent and designated representative (E.g. Consulting engineer and/or staff. Any release of the maintenance bond amount requires written authorization from the Board of Selectmen.

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EXHIBIT A

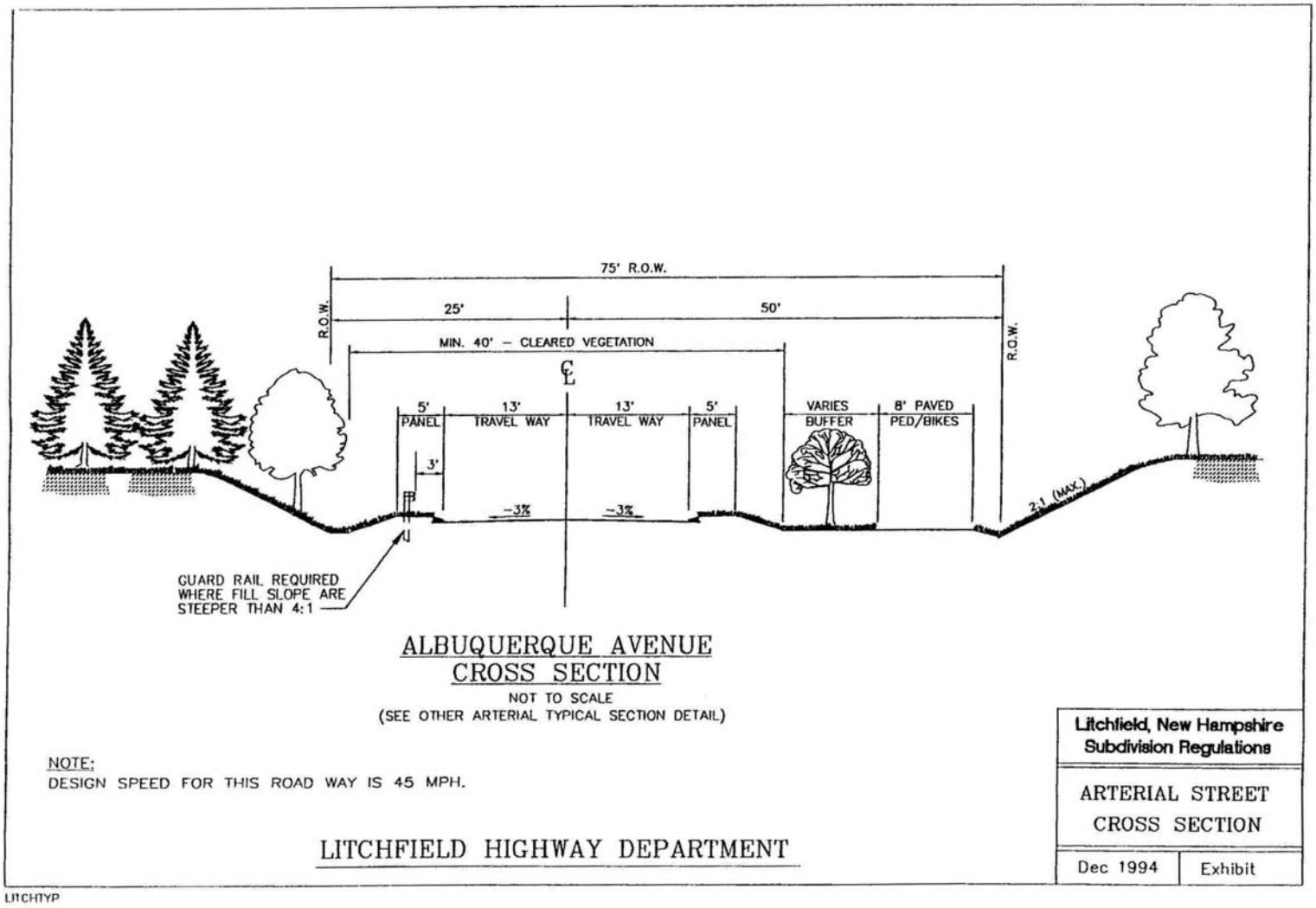

75' R.O.W.
R.O.W.
25'
50'
MIN. 40' – CLEARED VEGETATION
℄
R.O.W.
5' PANEL
13' TRAVEL WAY
13' TRAVEL WAY
5' PANEL
VARIES BUFFER
8' PAVED PED/BIKES
3'
-3%
-3%
2:1 (MAX.)
GUARD RAIL REQUIRED WHERE FILL SLOPE ARE STEEPER THAN 4:1
ALBUQUERQUE AVENUE
CROSS SECTION
NOT TO SCALE
(SEE OTHER ARTERIAL TYPICAL SECTION DETAIL)
NOTE:
DESIGN SPEED FOR THIS ROAD WAY IS 45 MPH.
LITCHFIELD HIGHWAY DEPARTMENT
Litchfield, New Hampshire
Subdivision Regulations
ARTERIAL STREET
CROSS SECTION
Dec 1994
Exhibit
LITCHTYP

EXHIBIT B

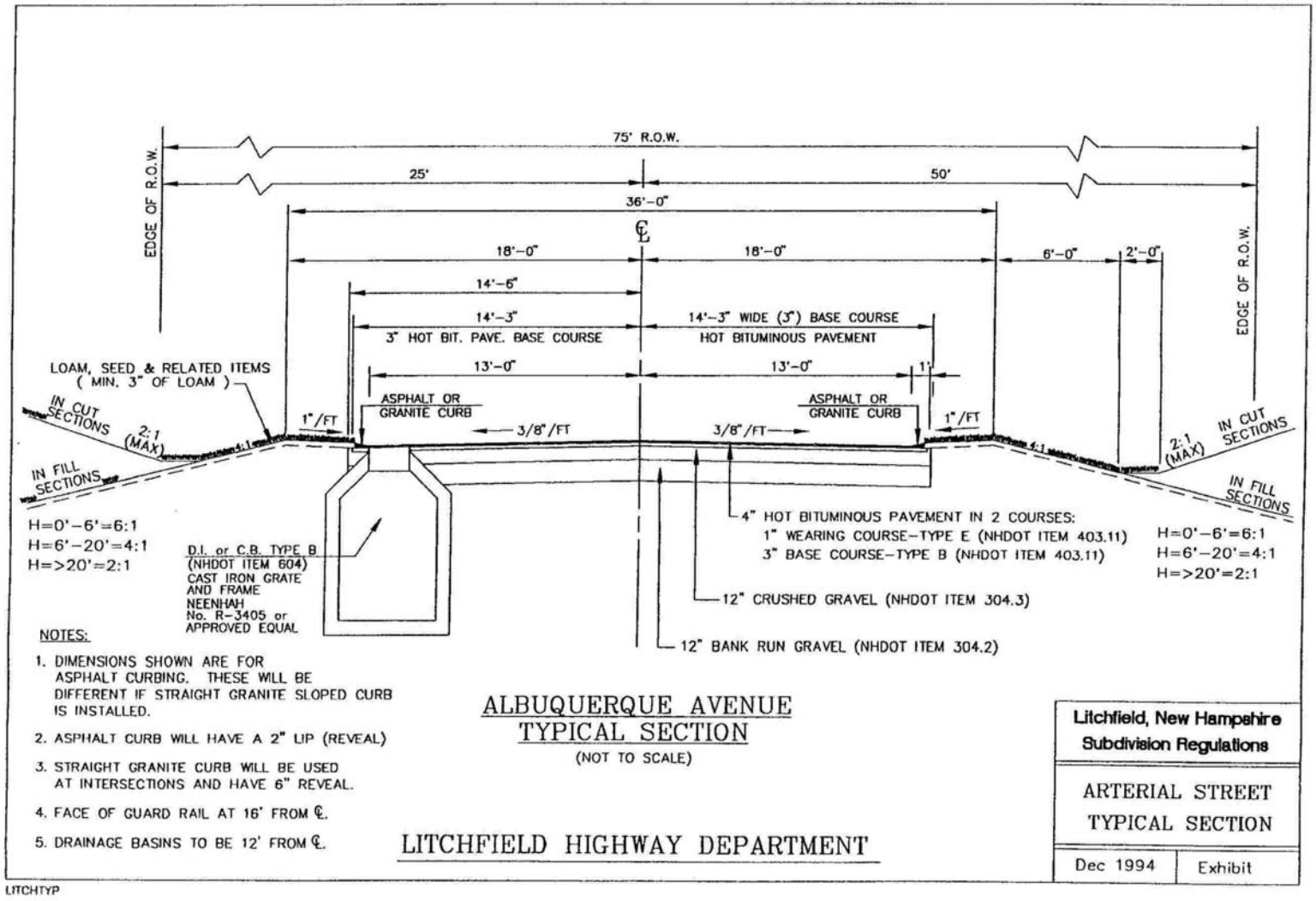

75' R.O.W.
25'
50'
36'-0"
EDGE OF R.O.W.
EDGE OF R.O.W.
18'-0"
18'-0"
6'-0"
2'-0"
14'-6"
14'-3"
3" HOT BIT. PAVE. BASE COURSE
14'-3" WIDE (3") BASE COURSE
HOT BITUMINOUS PAVEMENT
13'-0"
13'-0"
1'
LOAM, SEED & RELATED ITEMS
(MIN. 3" OF LOAM)
IN CUT SECTIONS
2:1 (MAX)
1"/FT
ASPHALT OR GRANITE CURB
3/8"/FT
3/8"/FT
ASPHALT OR GRANITE CURB
1"/FT
2:1 (MAX)
IN CUT SECTIONS
IN FILL SECTIONS
IN FILL SECTIONS
H=0'-6'=6:1
H=6'-20'=4:1
H=>20'=2:1
D.I. or C.B. TYPE B
(NHDOT ITEM 604)
CAST IRON GRATE
AND FRAME
NEENHAH
No. R-3405 or
APPROVED EQUAL
4" HOT BITUMINOUS PAVEMENT IN 2 COURSES:
1" WEARING COURSE-TYPE E (NHDOT ITEM 403.11)
3" BASE COURSE-TYPE B (NHDOT ITEM 403.11)
12" CRUSHED GRAVEL (NHDOT ITEM 304.3)
12" BANK RUN GRAVEL (NHDOT ITEM 304.2)
H=0'-6'=6:1
H=6'-20'=4:1
H=>20'=2:1
NOTES:
1. DIMENSIONS SHOWN ARE FOR ASPHALT CURBING. THESE WILL BE DIFFERENT IF STRAIGHT GRANITE SLOPED CURB IS INSTALLED.
2. ASPHALT CURB WILL HAVE A 2" LIP (REVEAL)
3. STRAIGHT GRANITE CURB WILL BE USED AT INTERSECTIONS AND HAVE 6" REVEAL.
4. FACE OF GUARD RAIL AT 16' FROM ℄.
5. DRAINAGE BASINS TO BE 12' FROM ℄.
ALBUQUERQUE AVENUE
TYPICAL SECTION
(NOT TO SCALE)
LITCHFIELD HIGHWAY DEPARTMENT
Litchfield, New Hampshire
Subdivision Regulations
ARTERIAL STREET
TYPICAL SECTION
Dec 1994
Exhibit
LITCHTYP

EXHIBIT C

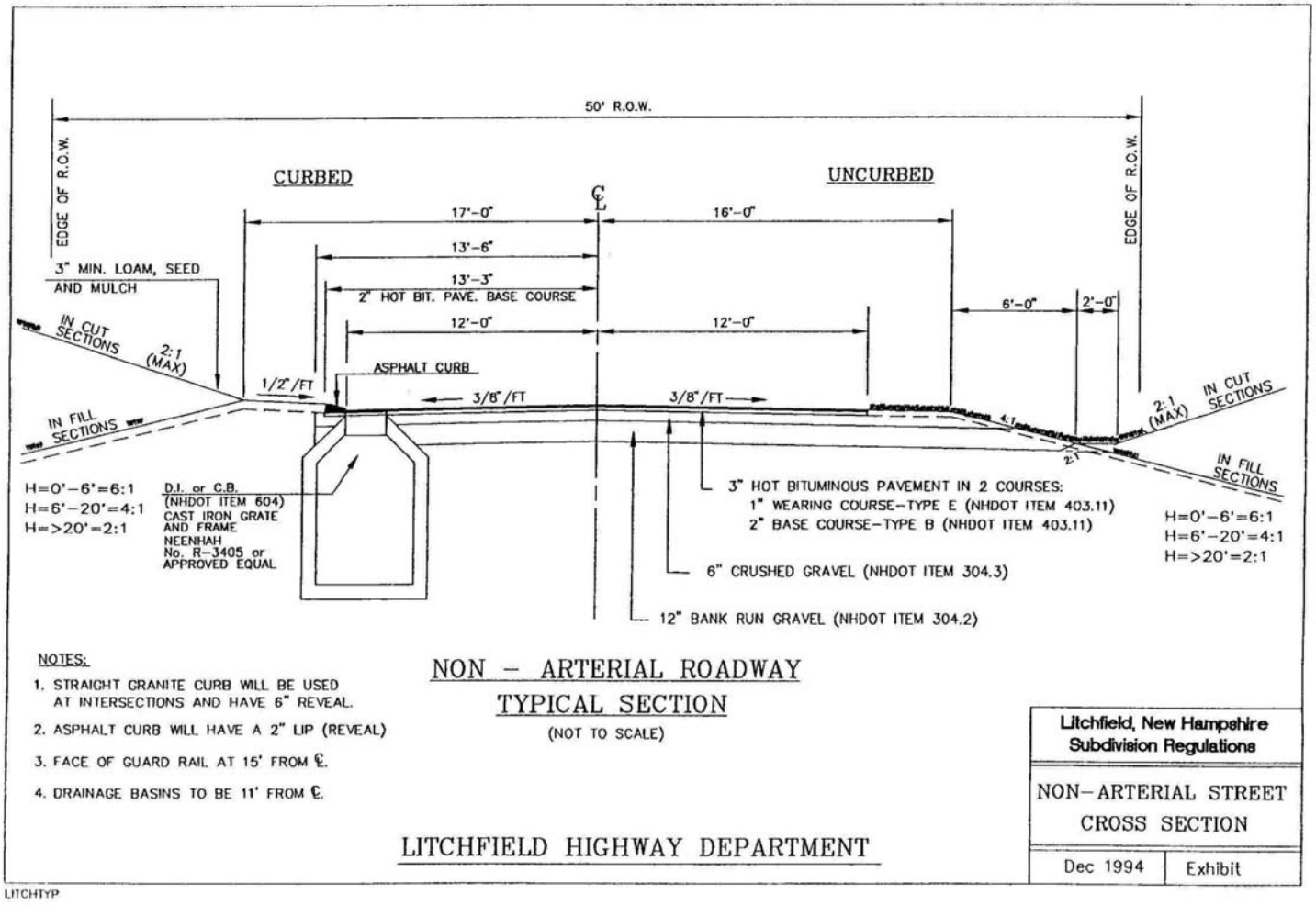
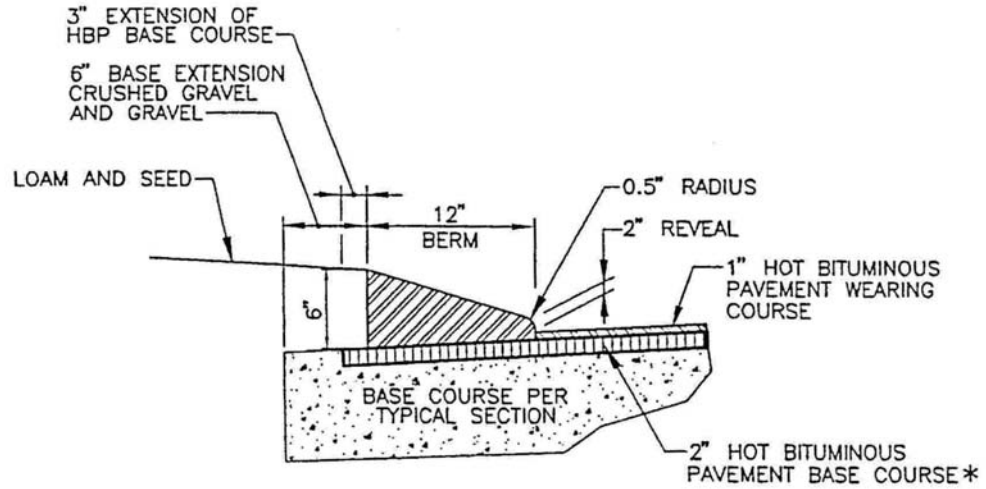

50' R.O.W.
EDGE OF R.O.W.
CURBED
UNCURBED
℄
17'-0"
16'-0"
13'-6"
13'-3"
2" HOT BIT. PAVE. BASE COURSE
12'-0"
12'-0"
6'-0"
2'-0"
EDGE OF R.O.W.
3" MIN. LOAM, SEED AND MULCH
IN CUT SECTIONS
2:1 (MAX)
1/2"/FT
ASPHALT CURB
3/8"/FT
3/8"/FT
IN FILL SECTIONS
4:1
2:1
2:1 (MAX)
IN CUT SECTIONS
IN FILL SECTIONS
H=0'-6'=6:1
H=6'-20'=4:1
H=>20'=2:1
D.I. or C.B. (NHDOT ITEM 604) CAST IRON GRATE AND FRAME NEENHAH No. R-3405 or APPROVED EQUAL
3" HOT BITUMINOUS PAVEMENT IN 2 COURSES:
1" WEARING COURSE-TYPE E (NHDOT ITEM 403.11)
2" BASE COURSE-TYPE B (NHDOT ITEM 403.11)
6" CRUSHED GRAVEL (NHDOT ITEM 304.3)
12" BANK RUN GRAVEL (NHDOT ITEM 304.2)
H=0'-6'=6:1
H=6'-20'=4:1
H=>20'=2:1
NOTES:
1. STRAIGHT GRANITE CURB WILL BE USED AT INTERSECTIONS AND HAVE 6" REVEAL.
2. ASPHALT CURB WILL HAVE A 2" LIP (REVEAL)
3. FACE OF GUARD RAIL AT 15' FROM ℄.
4. DRAINAGE BASINS TO BE 11' FROM ℄.
NON - ARTERIAL ROADWAY
TYPICAL SECTION
(NOT TO SCALE)
LITCHFIELD HIGHWAY DEPARTMENT
Litchfield, New Hampshire
Subdivision Regulations
NON-ARTERIAL STREET
CROSS SECTION
Dec 1994
Exhibit
LITCHTYP

EXHIBIT D



TYPICAL CAPE COD BERM SECTION

NOT TO SCALE

NOTES:

* 3" FOR ARTERIAL ROADWAY

(NOT TO SCALE)

Litchfield, New Hampshire Subdivision Regulations	
TYPICAL CAPE COD BERM	
December 1994	Exhibit D

EXHIBIT E

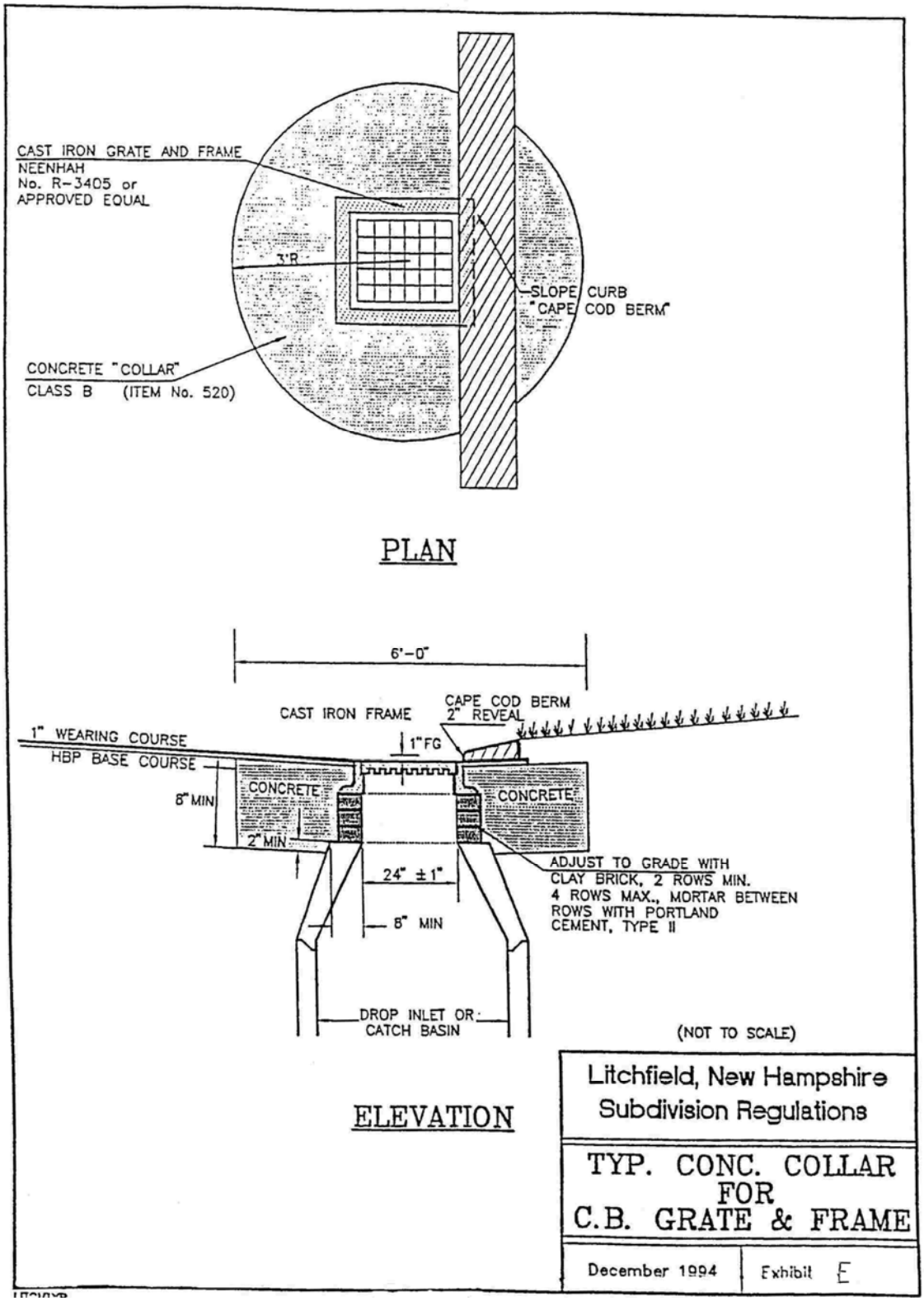
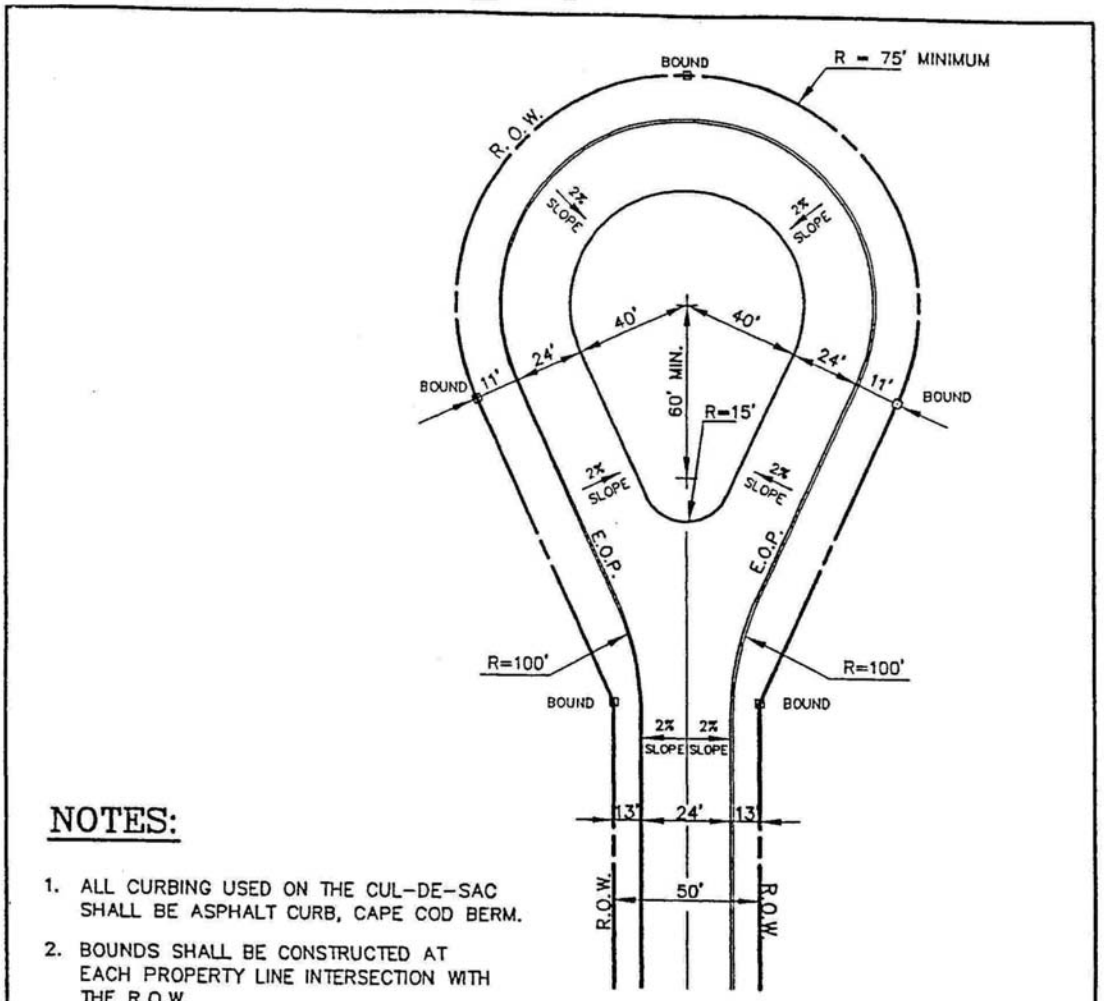

CAST IRON GRATE AND FRAME
NEENHAH
No. R-3405 or
APPROVED EQUAL
3'R
SLOPE CURB
"CAPE COD BERM"
CONCRETE "COLLAR"
CLASS B (ITEM No. 520)
PLAN
6'-0"
CAST IRON FRAME
CAPE COD BERM
2" REVEAL
1" WEARING COURSE
HBP BASE COURSE
1"FG
8" MIN
CONCRETE
CONCRETE
2" MIN
24" ±1"
8" MIN
ADJUST TO GRADE WITH
CLAY BRICK, 2 ROWS MIN.
4 ROWS MAX., MORTAR BETWEEN
ROWS WITH PORTLAND
CEMENT, TYPE II
DROP INLET OR
CATCH BASIN
(NOT TO SCALE)
ELEVATION
Litchfield, New Hampshire
Subdivision Regulations
TYP. CONC. COLLAR
FOR
C.B. GRATE & FRAME
December 1994
Exhibit E

EXHIBIT F



NOTES:

1. ALL CURBING USED ON THE CUL-DE-SAC SHALL BE ASPHALT CURB, CAPE COD BERM.
2. BOUNDS SHALL BE CONSTRUCTED AT EACH PROPERTY LINE INTERSECTION WITH THE R.O.W.
3. THE AREA INSIDE THE ISLAND SHALL BE CLEARED OF BRUSH LEAVING TREES 3' OR LARGER.
4. THE AREA INSIDE THE ISLAND SHALL BE GRADED TO DRAIN TO THE INSIDE AND A PROPER OUTLET PIPE PROVIDED.
5. THE CUL-DE-SAC MAY BE CONSTRUCTED LARGER AND WITH A DIFFERENT CONFIGURATION THAN SHOWN WITH THE APPROVAL OF THE PLANNING BOARD OR ITS AGENT. THE PAVEMENT WIDTHS SHOWN SHALL NOT BE REDUCED.
6. POSITIVE DRAINAGE OF THE PAVEMENT SHALL BE PROVIDED IN THE TRANSITION AREAS BETWEEN ROADWAY CROSS-SLOPES AND THE CUL-DE-SAC CROSS-SLOPES.

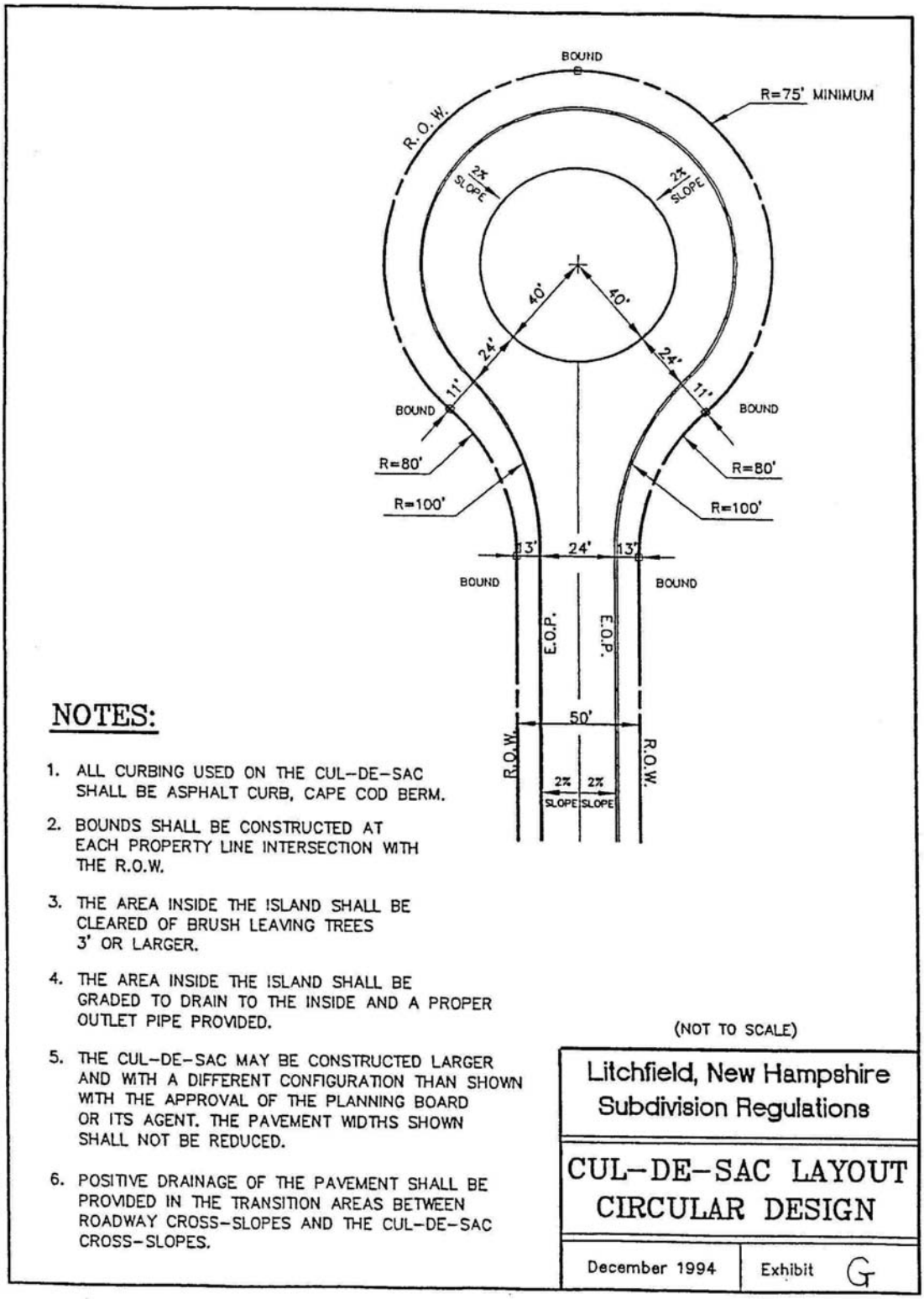
(NOT TO SCALE)

Litchfield, New Hampshire
Subdivision Regulations

CUL-DE-SAC LAYOUT
TEARDROP DESIGN

December 1994 | Exhibit F

EXHIBIT G



NOTES:

1. ALL CURBING USED ON THE CUL-DE-SAC SHALL BE ASPHALT CURB, CAPE COD BERM.
2. BOUNDS SHALL BE CONSTRUCTED AT EACH PROPERTY LINE INTERSECTION WITH THE R.O.W.
3. THE AREA INSIDE THE ISLAND SHALL BE CLEARED OF BRUSH LEAVING TREES 3' OR LARGER.
4. THE AREA INSIDE THE ISLAND SHALL BE GRADED TO DRAIN TO THE INSIDE AND A PROPER OUTLET PIPE PROVIDED.
5. THE CUL-DE-SAC MAY BE CONSTRUCTED LARGER AND WITH A DIFFERENT CONFIGURATION THAN SHOWN WITH THE APPROVAL OF THE PLANNING BOARD OR ITS AGENT. THE PAVEMENT WIDTHS SHOWN SHALL NOT BE REDUCED.
6. POSITIVE DRAINAGE OF THE PAVEMENT SHALL BE PROVIDED IN THE TRANSITION AREAS BETWEEN ROADWAY CROSS-SLOPES AND THE CUL-DE-SAC CROSS-SLOPES.

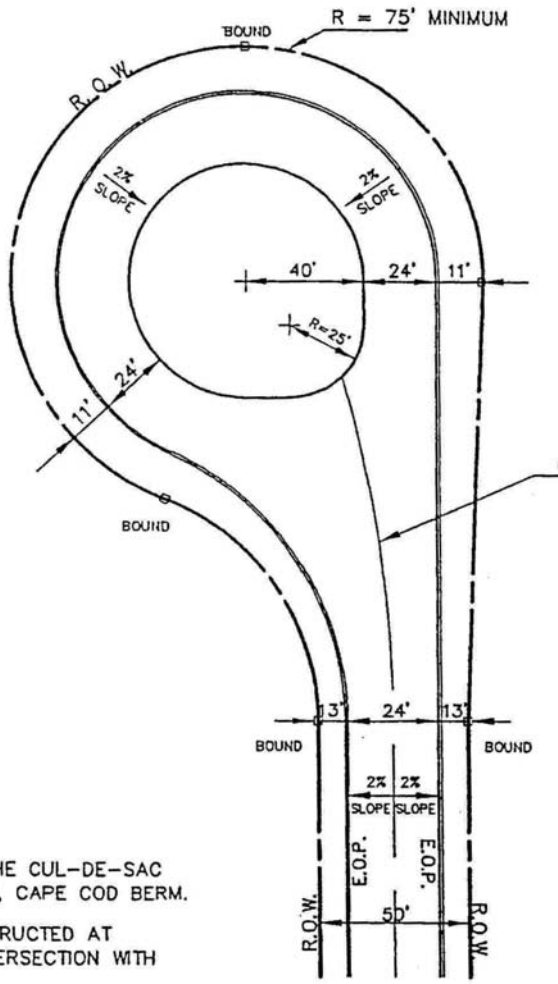
(NOT TO SCALE)

Litchfield, New Hampshire
Subdivision Regulations

CUL-DE-SAC LAYOUT
CIRCULAR DESIGN

December 1994 | Exhibit G

EXHIBIT H



NOTES:

1. ALL CURBING USED ON THE CUL-DE-SAC SHALL BE ASPHALT CURB, CAPE COD BERM.
2. BOUNDS SHALL BE CONSTRUCTED AT EACH PROPERTY LINE INTERSECTION WITH THE R.O.W.
3. THE AREA INSIDE THE ISLAND SHALL BE CLEARED OF BRUSH LEAVING TREES 3" OR LARGER.
4. THE AREA INSIDE THE ISLAND SHALL BE GRADED TO DRAIN TO THE INSIDE AND A PROPER OUTLET PIPE PROVIDED.
5. THE CUL-DE-SAC MAY BE CONSTRUCTED LARGER AND WITH A DIFFERENT CONFIGURATION THAN SHOWN WITH THE APPROVAL OF THE PLANNING BOARD OR ITS AGENT. THE PAVEMENT WIDTHS SHOWN SHALL NOT BE REDUCED.
6. THE DIRECTION OF THE "P" MAY BE REVERSED.
7. POSITIVE DRAINAGE OF THE PAVEMENT SHALL BE PROVIDED IN THE TRANSITION AREAS BETWEEN ROADWAY CROSS-SLOPES AND THE CUL-DE-SAC CROSS-SLOPES.

(NOT TO SCALE)

Litchfield, New Hampshire
Subdivision Regulations

CUL-DE-SAC LAYOUT
"P" DESIGN

December 1994 | Exhibit H

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#225I-79